



Food and Agriculture
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Unlocking the potential
of sustainable fisheries and aquaculture
in Africa, the Caribbean and the Pacific



SUMMARY REPORT

The purse seine tuna fishery value chain in the Marshall Islands

November 2022



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Background and rationale

FISH4ACP is an initiative of the Organisation of African, Caribbean and Pacific States (OACPS) contributing to food and nutrition security, economic prosperity and job creation by ensuring the economic, social and environmental sustainability of fisheries and aquaculture value chains in Africa, the Caribbean and the Pacific. FISH4ACP is implemented by the Food and Agriculture Organization of the United Nations (FAO) and partners with funding from the European Union and the German Federal Ministry for Economic Cooperation and Development (BMZ).

FISH4ACP seeks to enhance the productivity and competitiveness of twelve fisheries and aquaculture value chains in twelve OACPS member countries, making sure that economic improvements go hand in hand with environmental sustainability and social inclusiveness. It pays special attention to small and medium-sized businesses, because of their potential to deliver economic and social benefits, particularly for women and the youth.

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Acronyms and abbreviations

CA	competent authority
FAO	Food and Agriculture Organization of the United Nations
FFA	Pacific Islands Forum Fisheries Agency
GDP	gross domestic product
HACCP	Hazard Analysis Critical Control Point
JICA	Japan International Cooperation Agency
MIFV	Marshall Islands Fishing Venture (longline company)
MIMRA	Marshall Islands Marine Resources Authority
MWSC	Majuro Water and Sewer Company
OACPS	Organisation of African, Caribbean and Pacific States
PII	Pacific International Inc.
PPF	Pan Pacific Fishing Inc.
SOPS	standard operating procedures
VC	value chain
VC4D	value chain analysis for development
WCPO	Western Central Pacific Ocean
CA	competent authority
FAO	Food and Agriculture Organization of the United Nations
FFA	Pacific Islands Forum Fisheries Agency
GDP	gross domestic product
HACCP	Hazard Analysis Critical Control Point
JICA	Japan International Cooperation Agency
MIFV	Marshall Islands Fishing Venture (longline company)
MIMRA	Marshall Islands Marine Resources Authority

Glossary of terms

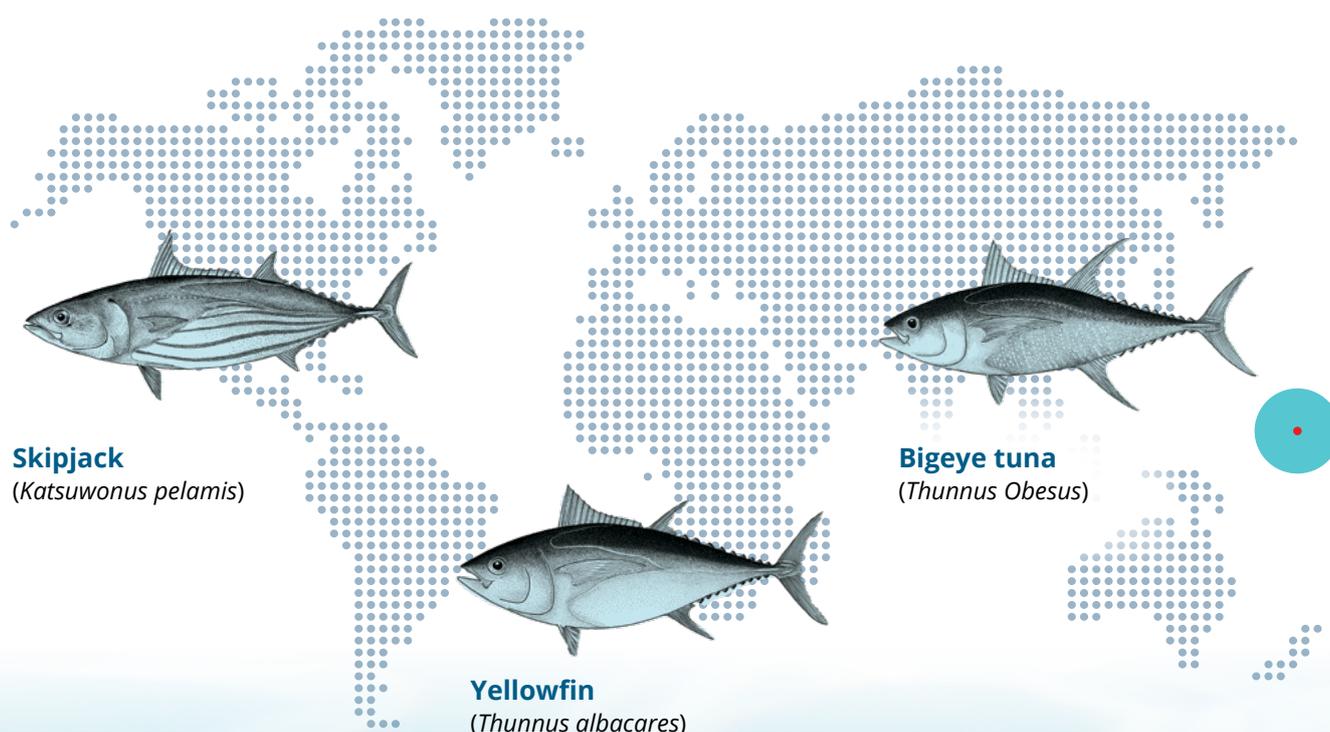
Carbon footprint	Calculated as the kg CO ₂ e/year at actor level, functional level, core value chain (VC) level, and per kg of end product.
Container stuffing	The process whereby fish are loaded into containers.
Containerization	The loading of fish from fishing vessels or shore-based facilities into containers (typically 20 ft or 40 ft in length).
Contribution (of VC) to gross domestic product (GDP)	100 * (total value added over national GDP), expressed as a percentage (%).
Direct value added	The sum of net profits (after taxes) for the companies, net wages for their workers, and government revenue in the form of taxes and fees.
Electricity use	Calculated as the kWh/year at actor level, functional level, core VC level and per kg of end product.
Fish aggregating device	Artificial or natural floating object placed on the ocean surface, often anchored to the bottom, to attract several schooling fish species, thus increasing their catchability.
Fishing pressure	Refers to the level of fishing effort (active fishing licenses or boats, number of days fishing, number of hooks per day, yield per day, etc.) that the fish stock is subject to.
Food loss and waste	Refers to the quantitative and qualitative loss of aquatic products that have been intended for human consumption but have either suffered due to, e.g. poor transportation and processing practices, and are thus no longer fit for human consumption, or have been discarded by different actors based on, e.g. consumer preferences and demands. To measure food loss, the quantities of aquatic products lost along the VC, from production up to but not including retail are calculated. Food waste refers to the aquatic food lost in the retail and consumption functions of a VC.
Fuel consumption	Calculated as MJ/year at actor level, functional level, core VC level and per kg of end product.
Fulltime equivalent (FTE) jobs	The total number of eight-hour working days divided by 230 (days).
Indirect value added	The cost of the domestic goods and services that the VC actors purchase from outside the core VC (therefore does not include the cost of raw materials [whole tuna] sold/bought along the VC).
Longline	A fishing gear in which short lines carrying hooks are attached to a longer main line at regular intervals. Longlines are laid on the bottom or suspended horizontally at a predetermined depth with the help of surface floats. The main lines can be as long as 150 km and have several thousand hooks (e.g. in tuna fisheries).
Net impact on balance of trade (of VC)	Calculated by deducting imports from exports (in USD) for all products related to the VC, including both the VC's products and the inputs/ services used in the VC.

Net impact on public funds	The net impact on public funds is expressed in USD and equals taxes plus fees minus subsidies.
Overfished	A stock is considered overfished when exploited beyond an explicit limit beyond which its abundance is considered “too low” to ensure safe reproduction. In many fisheries for the term is used when biomass has been estimated to be below a limit biological reference point that is used as the signpost defining an “overfished condition”.
Overfishing	A term used to refer to the state of a stock subject to a level of fishing effort or fishing mortality such that a reduction of effort would, in the medium term, lead to an increase in the total catch. Often referred to as overexploitation and equated to biological overfishing.
Profit	Revenues minus costs.
Purse seine	Nets characterized by the use of a purse line at the bottom of the net. The purse line enables the net to be closed like a purse and thus retain all the fish caught. The purse seines, which may be very large, are operated by one or two boats.
Rate of integration	The rate of integration (expressed as a percentage) indicates how much the VC is part of the national economy. It is calculated as $100 * (\text{total VA} / [\text{total VA} + \text{imported consumables}])$.
Reefer container	A refrigerated container, used for chilled or frozen goods.
Return on investment	$100 * (\text{operating profit over total cost})$, expressed as a percentage (%).
Return on sales	$100 * (\text{net profit over total revenues})$, expressed as a percentage (%).
Stevedoring	Activities related to the loading and unloading of cargo.
Stock status	The stock status refers to the biomass (B) of fish in the water and provides information on whether a stock is overfished, maximally sustainably fished or underfished. The amount of biomass (B) that produces the maximum sustainable yield (MSY) is referred to as BMSY. If the biomass of fish in the water is below BMSY, the stock is overfished. If the amount of fish in the water is more than what would produce MSY, the stock is underfished.
Total value added	The sum of direct value added and indirect value added.
Transshipment	The loading of fish from fishing vessels onto carrier vessels without being brought onto the shore. Transshipped fish does not constitute a landing into, or an export from, the country where transshipment takes place.
Tuna loining	The process of cutting flesh from the backbone lengthwise and normally into quarters.
Vessel day scheme	A scheme where vessel owners can purchase and trade days fishing at sea in places subject to the Parties to the Nauru Agreement.

1. Introduction

FISH4ACP is an initiative of the Organization of African, Caribbean and Pacific States (OACPS) to support sustainable fisheries and aquaculture development. The five-year value chain (VC) development programme (2020 to 2025) is implemented by the Food and Agriculture Organization of the United Nations (FAO) with funding from the European Union and the German Federal Ministry for Economic Cooperation and Development (BMZ).

The purse seine (PS) tuna VC in the Marshall Islands is one of 12 VCs competitively selected from over 70 proposals worldwide for support from the FISH4ACP programme. This report presents the outputs of analysis and design work completed in 2021 to conclude a functional analysis of the VC, assess its sustainability and resilience, develop an upgrading strategy to which the FISH4ACP programme will contribute, and plan for full implementation from January 2022.¹



¹ This summary document is based on a supporting and more detailed analysis and design document, not officially published by FAO but available on request (Macfadyen, G., Duong, G., Stege, M., Sahib, M., Bain-Vete, M. & Gillett, R. 2022. *The purse seine tuna fishery value chain in the Republic of the Marshall Islands: Analysis and design report*. Rome, FAO). The more detailed document provides additional information on methodology, supporting analytical tables and detailed calculations, and background and supporting data.

Figure 1. Typical purse seine tuna vessel



The **methodology** used by a small team of FAO consultants to complete the work included: a review of more than 110 reports, publications and databases; primary research and consultations with stakeholders within and outside of the Marshall Islands using a variety of methods (e.g. focus groups, observational visits and interviews); and a series of stakeholder workshops during 2021 to introduce the work, validate emerging findings and agree on an upgrading strategy for the VC. The methodology used a participatory approach with the private sector, government, other donors, civil society and regional organizations. The consultants were supported throughout their work by the Marshall Islands Marine Resources Authority (MIMRA). The structure of this report, and the basis for assessing and scoring the VC's economic, social and environmental sustainability and resilience followed and adhered to the FISH4ACP methodology.

2. Functional analysis

The core VC actors in the Marshall Islands are few in number, with three catching sector companies (with a combined total of 12 vessels) and one processing company, relying on catches of skipjack tuna and smaller amounts of yellowfin and bigeye tuna.

Figure 2. Skipjack tuna, the main species caught in purse seines



Catches by Marshall Islands-flagged purse seine vessels in the Western Central Pacific Ocean (WCPO) convention area are around 95 000 tonnes per year and represent less than 5 percent of 2 million tonnes a year of purse seine catches in the WCPO over the period 2015 to 2019. The small quantity of catch landed by Marshall Islands-flagged and foreign vessels and/or processed in the Marshall Islands for export (ca. 15 000 tonnes of containerized tuna products in 2019) is of strategic importance for potential upgrading of the purse seine VC, given the large volume of catches being transhipped through the Marshall Islands (ca. 360 000 tonnes in 2019) which are not considered as exports, and which generate little on-shore added value in the Marshall Islands.

While the end market for purse seine tuna catches in the VC is the global canned tuna market, tuna canneries and tuna brokers are the principal market for actors in the VC based in the Marshall Islands, as well as for purse seine vessels flagged to other countries which tranship catch in Majuro. For purse seine-caught tuna leaving the Marshall Islands as exports, or transhipped product for canneries, most product is currently processed in Thailand, Viet Nam, the Philippines, China, the Republic of Korea and Japan, but some shipments are delivered to Papua New Guinea,

Fiji, Solomon Islands and American Samoa for canning (MIMRA, 2018). For Marshall Islands-flagged catches, most skipjack transshipments are processed in Thailand, with much of the larger containerized yellowfin tuna destined for Viet Nam and Indonesia.

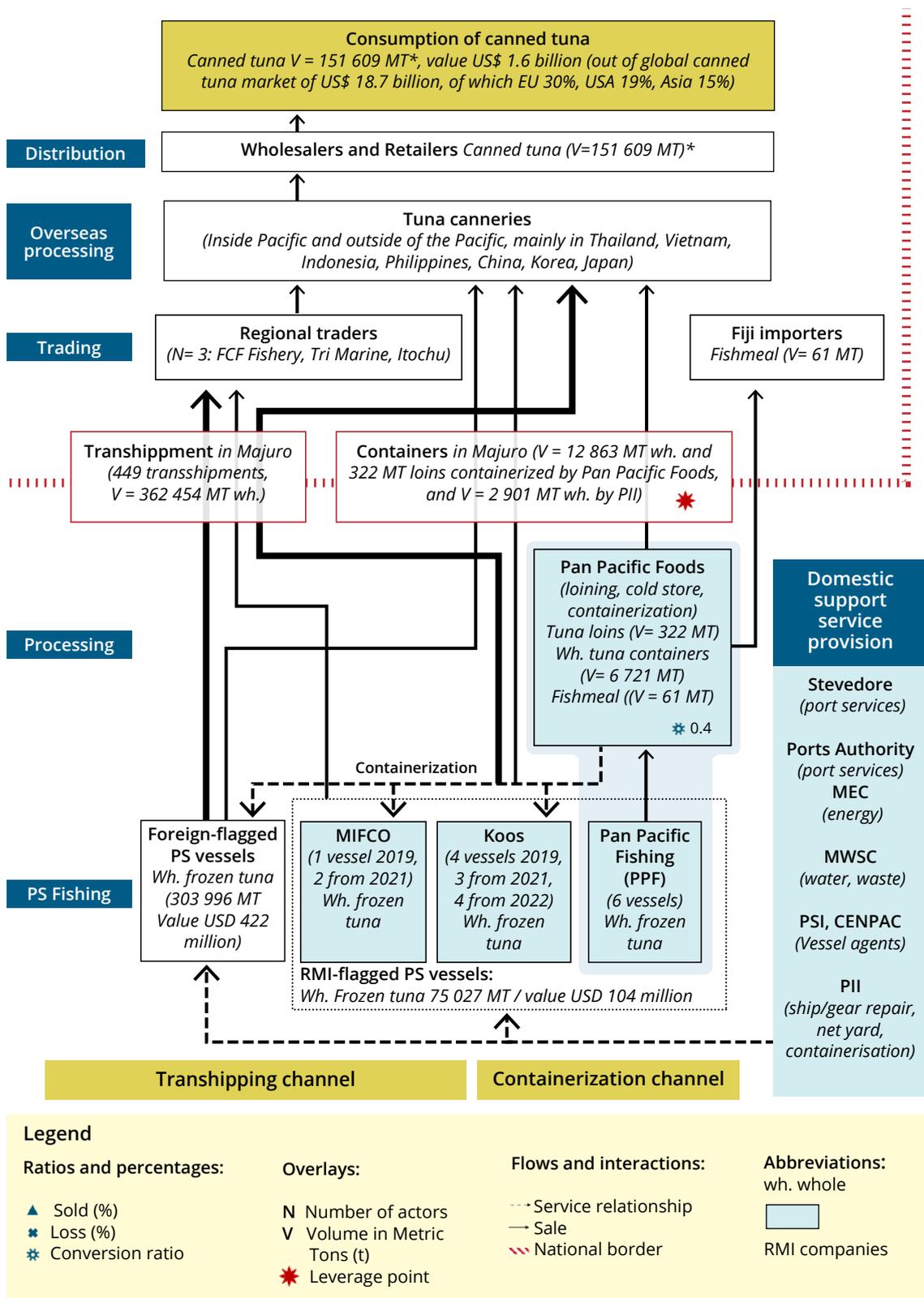
Also of strategic importance to potential VC upgrading are the **high prices of canned tuna in the European Union compared to many other global markets** and the fact that without an European Union-approved competent authority (CA) to ensure sanitary controls, catches landed in the Marshall Islands cannot be processed – either in the Marshall Islands or elsewhere – for sale in European Union markets. **Differences in prices for individual species paid by canneries based on size and quality, and especially the higher prices paid for large yellowfin tuna, provide one of the potential strategic opportunities of interest to this project and the VC upgrading strategy for purse seine-caught tuna:** containerization of catch, rather than transshipment and transport by carrier vessels, would allow for the catch to be sorted by species, quality and size, with product then split into containers and sold to different canneries based on their individual processing requirements at different times and therefore price differentials that may exist between canneries.

Figure 3. Purse seine transshipment in Majuro, Marshall Islands



The functional analysis enabled the preparation of the **VC map presented in Figure 4.**

Figure 4. The Marshall Islands' purse seine tuna fishery value chain map



Note: 1) All data for 2019. 2) The map depicts the canned tuna deriving from the skipjack, yellowfin and bigeye tuna landed or transhipped in Majuro. 3) *: Assuming a conversion rate of loins to whole round weight of 40%, the amount of canned tuna at the Distribution and Consumption levels is 40% of the sum of RMI-flagged and foreign-flagged catches (75 027 MT + 303 996 MT).

Source: Macfadyen, G., Duong, G., Steve, M., Sahib, M., Bain-Vete, M. & Gillett, R. 2022. *The purse seine tuna fishery value chain in the Republic of the Marshall Islands: Analysis and design report*. Rome, FAO.

The VC operates within a **supportive enabling environment**, with good regional arrangements for the management and conservation of fish stocks on which the VC relies, for example through the Western Central Pacific Fisheries Organisation and the Parties to the Nauru Agreement. At the national level, legislation is fit for purpose and dock infrastructure is largely sufficient for the current level of operations, although shore-side space is limited and competition for access to quay wall space can create delays for fishing vessels to unload and for carrier vessels to be filled.

Figure 5. Delap dock



A range of **organizations** (e.g. ministries and agencies) are in place in the Marshall Islands to provide support to the VC and several **donors and technical agencies** (e.g. World Bank, Japan International Cooperation Agency (JICA), Asian Development Bank, The Nature Conservancy, FAO and Pacific Islands Forum Fisheries Agency [FFA]) also support the fisheries sector in the Marshall Islands.

3. Sustainability and resilience assessment

An **assessment of the economic performance of the VC** reveals a heavy reliance on government support in the form of access fee concessions (costing the government around USD 7 million a year in lost vessel day revenue) and poor economic performance of core VC actors in 2019. Specifically, the three catching sector companies generated USD 5.6 million of profit in 2019 representing poor returns on sales of between -0.1 percent and 13 percent. The processing company in the VC generated a significant loss of USD 1.8 million and a return on sales of -103 percent. This may be largely explained by depressed international prices for tuna used as raw material inputs by canneries in 2019 (for all core VC companies) and the challenges related to labour (for the processing company).

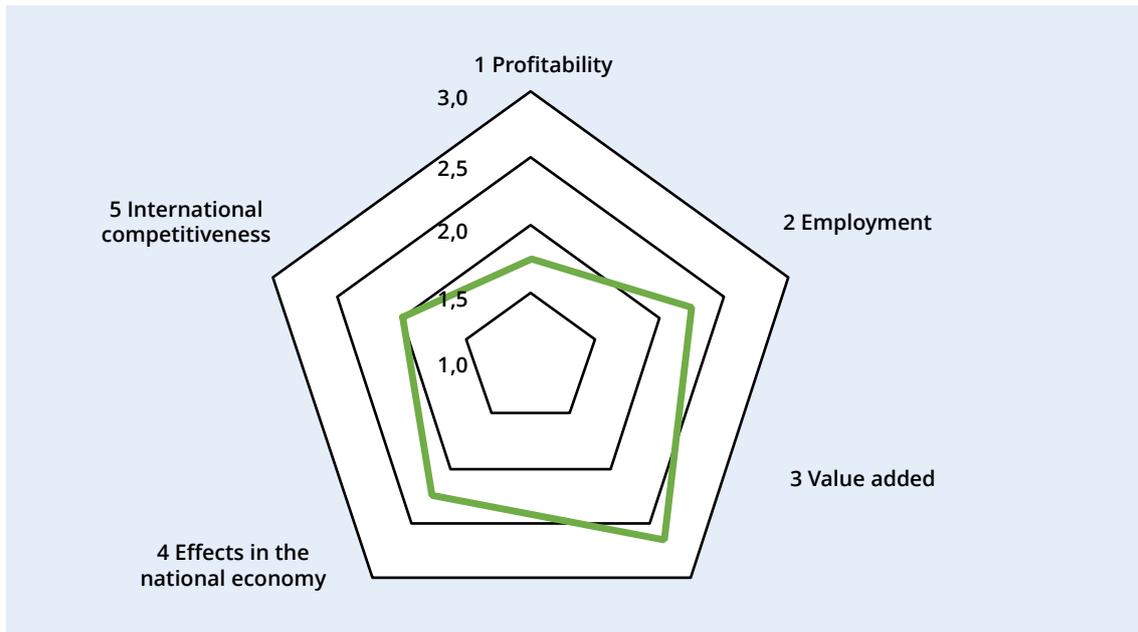
The VC also has a negative net impact on the balance of trade due to significant imports of inputs (e.g. fuel), with low levels of exports valued at USD 11 million in 2019 (transshipped fish are not categorized as exports). Also of concern is that two-thirds of the total employment in the core VC (460 people), and especially higher-ranked and higher-paid positions, are for non-Marshall Islands residents. This, along with foreign ownership of some Marshall Islands-based companies in the VC contributes to “economic leakage” of benefits from the VC from the Marshall Islands. More positively, the core VC generated around USD 20 million in 2019 in direct value added, which made up 20 percent of national gross domestic product (GDP) in that year. Over USD 14 million of the direct value added is fees and taxes to the government, implying that the broader society may benefit from expenditure by government made possible by revenues from the VC. The value added from the VC is higher when also considering support service providers to the VC, which contributed an additional USD 25 million of indirect value added. In terms of employment for Marshall Islands residents, the core VC provides employment for 164 people (both full-time and part-time), with an additional 573 employed in related support services.

A summary of the economic sustainability assessment across different domains considered within the FISH4ACP methodology is presented below.

Analysis of the social performance of the VC demonstrates that social sustainability is good in terms of a lack of discrimination and child labour, companies being formally registered and complying with national employment laws, and the presence of employment contracts (although the latter is not universally the case). And, while the VC makes no significant contributions to direct food security as virtually no catches from Marshall Islands-flagged vessels or those transshipping in Majuro are sold on the domestic market, it contributes to indirect food security by enabling those employed in the VC to purchase food. However, the social assessment highlighted “hotspots” in relation to: i) an unbalanced distribution of wages and employment in favour of non-Marshall Islands nationals compared to Marshall Islands nationals; low wages for lower-skilled employees of around USD 3.5 per hour, only just about the minimum wage of USD 3 per hour; ii) the temporary nature of much employment reducing the attractiveness of working in the VC; iii) potential concerns about poverty among workers; and iv) a small share of value added captured by women and few women holding decision-making roles compared to men (women account for only around one-third of the Marshall Islands resident full-time and part-time workers in the core VC and are mostly employed to work in the loining plant as unskilled or low-skilled workers).

A summary of the social sustainability assessment across different domains considered within the FISH4ACP methodology is presented below.

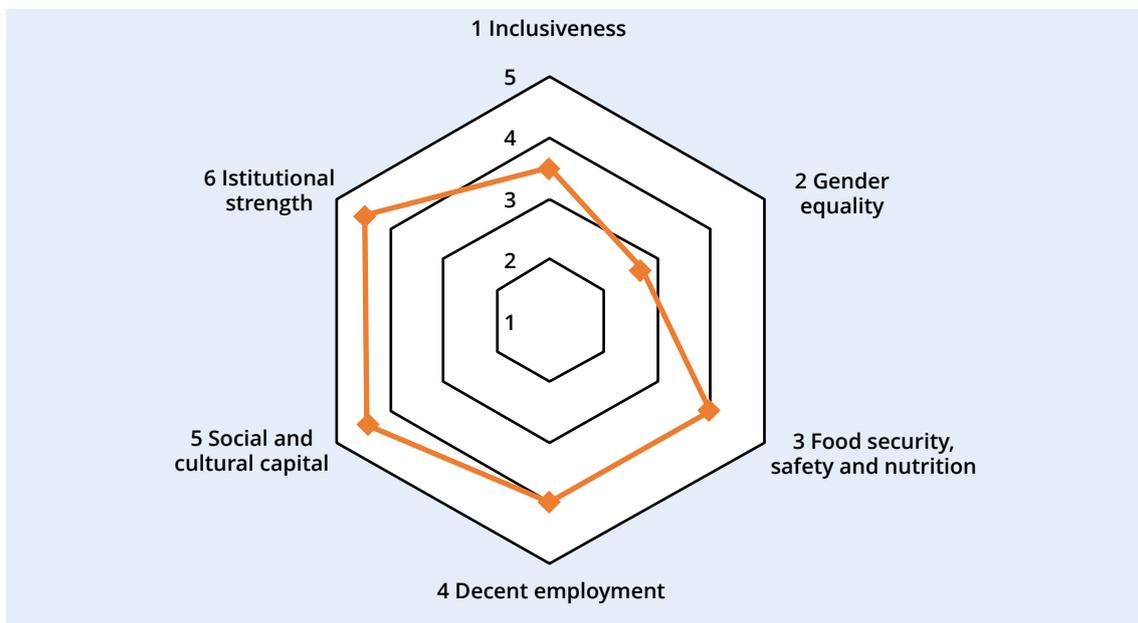
Figure 6. Economic sustainability performance scores for the value chain



Note: The figure shows the scores of five economic domains, which are the averages of the scores of the subdomains under each domain. The scores range from 1 (highly concerning/unsustainable) to 3 (not concerning/sustainable).

Source: Macfadyen, G., Duong, G., Steve, M., Sahib, M., Bain-Vete, M. & Gillett, R. 2022. *The purse seine tuna fishery value chain in the Republic of the Marshall Islands: Analysis and design report*. Rome, FAO.

Figure 7. Social sustainability performance scores for the value chain



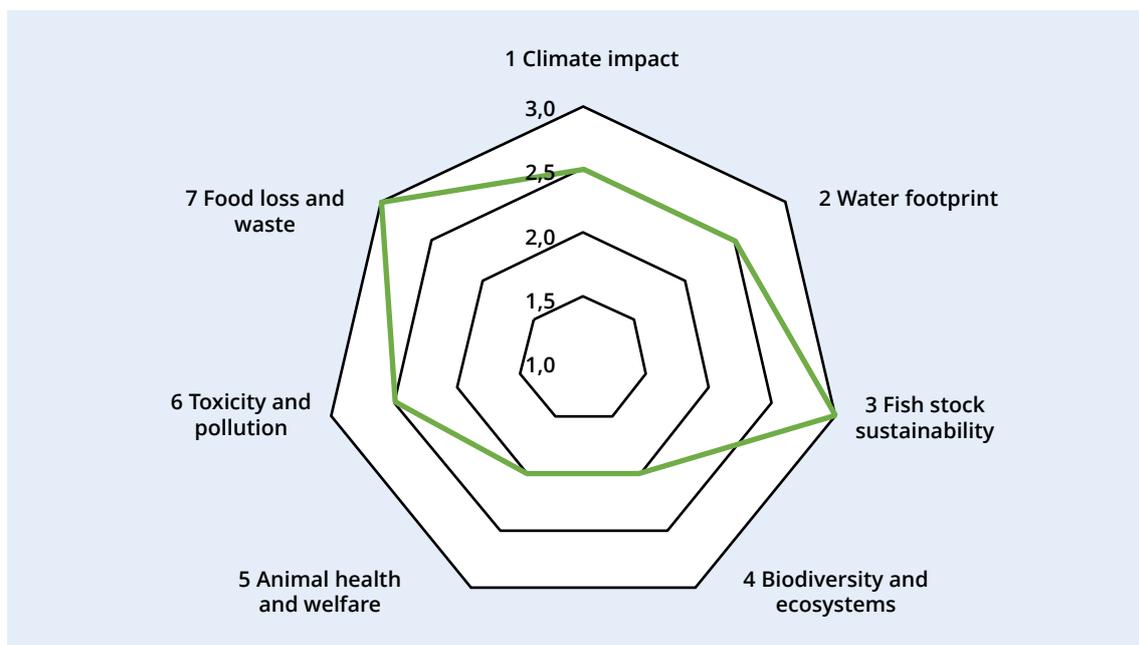
Note: The figure shows the scores of six social domains, which are the averages of the scores of the subdomains under each domain. The scores range from 1 (highly concerning/unsustainable) to 5 (not concerning/sustainable).

Source: Macfadyen, G., Duong, G., Steve, M., Sahib, M., Bain-Vete, M. & Gillett, R. 2022. *The purse seine tuna fishery value chain in the Republic of the Marshall Islands: Analysis and design report*. Rome, FAO.

In assessing the environmental sustainability of the VC it is noted that VC actors use only around 3 percent of the mains Majuro water supply. In terms of energy, while onshore companies in the VC (including the processing company and support service providers) maintain their own backup diesel generators and fuel storage to minimize disruptions due to inconsistent grid supply, most rely on mains electricity supply. No companies yet use renewable sources of energy such as solar power for their electricity needs. The high fossil fuel use by purse seine vessels is, however, the most significant source of climate impact by the VC, but fuel emissions by core VC actors are low in comparison to those of the fleet operating in the exclusive economic zone of the Marshall Islands (173 in 2019) or the Western Pacific as a whole (285 in 2019), and also low per tonne of animal protein generated when compared to other fishing methods. Since catches by Marshall Islands-flagged vessels are less than 4 percent of catches in the WCPO) over the period 2015 to 2018, it can be inferred that their operation has limited impacts on the regional (WCPO) tuna stocks. In addition, the stocks of skipjack, yellowfin and bigeye tuna caught by vessels in the VC are not assessed as being overfished. The purse seine fishery is a very “clean” fishery with little bycatch (ca. <1 percent by volume), although there is some bycatch of sharks and marine mammals, and concern over North Pacific striped marlin, which is assessed as being in an overfished state.

A summary of the environmental sustainability assessment across different domains considered within the FISH4ACP methodology is presented below.

Figure 8. Environmental sustainability performance scores for the value chain



Note: The figure shows the scores of seven environmental domains, which are the averages of the scores of the subdomains under each domain. The scores range from 1 (highly concerning/unsustainable) to 3 (not concerning/sustainable).

Source: Macfadyen, G., Duong, G., Steve, M., Sahib, M., Bain-Vete, M. & Gillett, R. 2022. *The purse seine tuna fishery value chain in the Republic of the Marshall Islands: Analysis and design report*. Rome, FAO.

Six potential shocks to the VC are considered mostly likely to test its **resilience**: i) fluctuations in the price of fish paid by traders and canneries; ii) an increase in the price of vessel days; iii) a decline in fish catches; iv) an increase in fuel costs; v) reduced availability of reefer vessels for transport of catches from the Marshall Islands; and vi) reduced levels of transshipments in Majuro. The small number of actors in the VC and catching sector companies, being part of larger, vertically integrated companies, increases the VC's resilience to shocks. However, concerns over the resilience of the VC arise from the highly competitive nature of the business sector which potentially reduces collaboration; low levels of diversity in the VC; and a low ability to change activities given the levels of investments made in purse seine vessels. Shocks to the VC could therefore have significant impacts on profits, revenues to government, employment and wages.

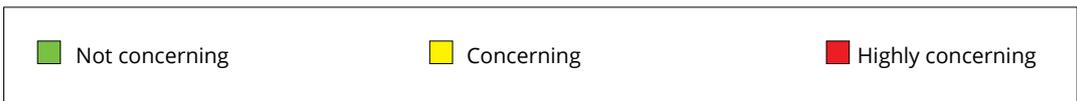
Asustainability heat map (Figure 9) provides a synthesis of the economic, social and environmental sustainability assessments, and the resilience analysis. The main conclusions to be drawn from the heat map are that there is mixed performance across all three sustainability dimensions and resilience. Social and environmental sustainability are the areas where the VC demonstrates the best performance, while resilience is the weakest area. There are seven hotspots in terms of the VC's sustainability performance and resilience, or over 10 percent of all subdomains under consideration. However, the number of "concerning" (yellow) areas is also high (26 areas, or over 40 percent of all the subdomains).

Figure 9. The Marshall Islands' purse seine tuna value chain sustainability heat map

Economic sustainability	Social sustainability	Environmental sustainability
Net profits	Wages and employment distribution	Electricity use
Trend in net profits	Value added distribution	Fuel consumption
Return on sales	Poverty and vulnerability	Carbon footprint
Return on investment	Discrimination	Renewable clean energy use
No. of jobs in FTE	Women's economic involvement	Water and ice consumption
No. of salaried jobs	Gendered division of labour	Water pollution
Average wage for hired workers	Gendered access to productive resources	Stock status and dynamics
Total value of net wages	Women's decision-making & leadership	Fishing pressure
Direct value added at core VC level	Availability of food (tuna)	Associated species
Indirect value added at VC level	Respect for labour rights	Vulnerable ecosystems
Total value added at VC level	Child and forced labour	Endangered, threatened and protected species
Contribution to GDP	Job safety and security	Biosecurity measures
Net impact on the balance of trade	Job attractiveness	Animal husbandry
Rate of integration	Collective action	Chemicals use
Net impact on public funds	Coordination of transactions	Air pollution

(cont.)

International competitiveness	Social cohesion	Inorganic waste pollution
	Cultural traditions	Organic waste pollution
	Policy, regulations and standards	Food loss
	Access to finance	
	Access to natural resources	
	Access to information	
Resilience		
Redundancy	Diversity	Connectivity
Collaboration	Learning and adaptation	Participation and inclusion



Economic sustainability score:²	59%
Social sustainability score:	76%
Environmental sustainability score:	75%
Resilience score:	33%
Overall sustainability score:	67%
Number of highly concerning hotspots (red):	7

Source: Macfadyen, G., Duong, G., Steve, M., Sahib, M., Bain-Vete, M. & Gillett, R. 2022. *The purse seine tuna fishery value chain in the Republic of the Marshall Islands: Analysis and design report*. Rome, FAO.

² According to the FISH4ACP methodological guide, “the (sustainability scores) indexes are calculated by adding up across subdomains (1 for green, 0.5 for yellow, 0 for red) and dividing this by the number of subdomains, expressed as a percentage”.



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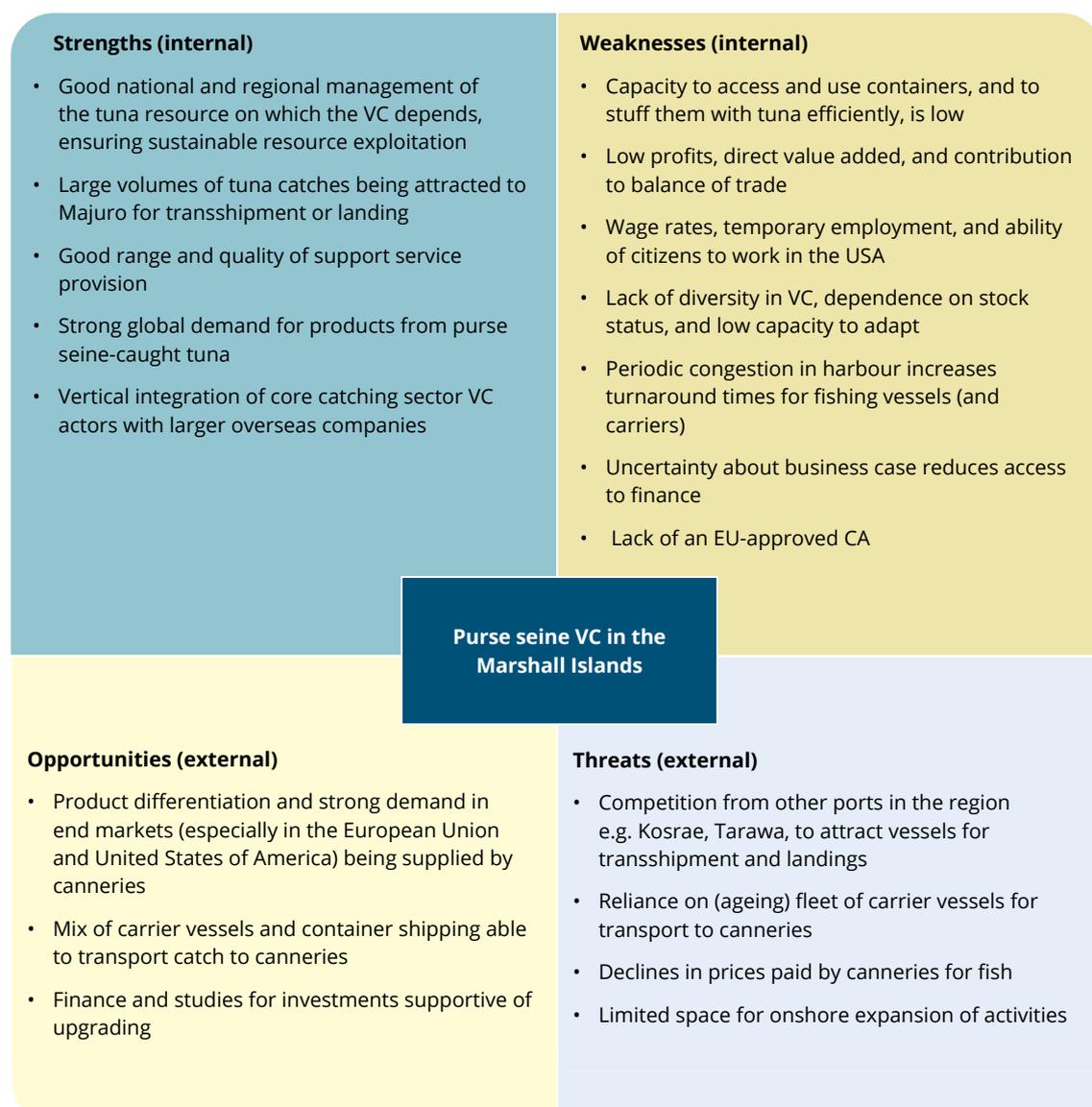
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4. Upgrading strategy

Considering the VC and shifting from analytical complexity to strategic simplicity, an analysis of the **strengths, weaknesses, opportunities and threats (SWOT) of the VC to inform the upgrading strategy** is provided below.

Figure 10. SWOT of the Marshall Islands' purse seine tuna value chain



Source: Macfadyen, G., Duong, G., Steve, M., Sahib, M., Bain-Vete, M. & Gillett, R. 2022. *The purse seine tuna fishery value chain in the Republic of the Marshall Islands: Analysis and design report*. Rome, FAO.

The **strengths** of the VC are that it relies on a well-managed and abundant resource that is not currently exhibiting signs of being overfished or subject to overfishing. Demand for products from purse seine-caught fish in end markets in the European Union and the United States of America, and therefore from tuna traders and canneries as intermediate markets, is strong. Majuro is already a major transshipment hub in the Pacific, supported by the good range of service provision on offer for domestic and visiting vessels. The fact that core VC actors in the form of catching sector companies are part of larger, vertically integrated companies is also a strength in terms of the financial, technical and managerial support that these larger companies can provide to VC actors.

Despite the large volumes of product passing through Majuro port, **weaknesses** of the VC include the fact that only a small proportion of catches are landed. This reduces onshore generation of value add and employment, and negatively impacts on the ability of the VC to contribute to direct value added and to the national balance of trade (as transshipments are not exports). The failure to sort and grade significant quantities of tuna when being transshipped, to the extent that it could/can be when landed, in turn means that larger sized fish, and yellowfin tuna in particular, are not being shipped to canneries in whole or loined form to exploit product differentiation in end markets, impacting negatively on prices paid for catches. Other key weaknesses are low availability and productivity of labour in shore-based operations (especially for loining), low cold storage capacity which compromises the ability to sort and store catches and to maintain quality (and loined product) prior to export, low speeds of stuffing containers thereby compromising fish quality, and low resilience of the VC actors to potential shocks. A major weakness at present is the inability of the VC to export to the European Union (with its strong demand and good prices) due to the lack of a certified CA, but also potentially due to food safety standards on vessels and in onshore facilities which a CA would be monitoring.

Considering potential **opportunities** for the VC, these revolve most strongly around the demand by canneries for product that is better sorted by species and size (especially for larger yellowfin tuna) to allow them to produce higher-value and differentiated products for end markets (e.g. yellowfin-specific). This in turn should enable canneries and traders to pay better prices for catch provided to them by vessels landing their catch in the Marshall Islands. But, to do so requires exports in containers to better enable sorted catches to be sent to different canneries with different requirements and therefore paying different prices. Given the vertical integration within the VC, opportunities also exist to capitalize on the ability of parent companies to provide finance, and to provide blended finance which would mix project finance with that from private sector parties and other potential investors (e.g. the public sector, impact investors and investment funds) to support VC upgrading. Enabling finance for specific VC investments can also be supported by detailed studies demonstrating the financial viability of such investments.

Looking to the future, it is important to consider the **threats** to the VC. These include the potential for other ports in the region to attract transshipment and landings away from the Marshall Islands. This is also of concern because it could jeopardise benefits (in economic and employment terms) to the Marshall Islands currently being generated by both the government (through transshipment fees) and the support service sector. This threat would be more likely to materialize if the Marshall Islands does not gear up to better provide for container exports, if other ports do (to capitalize on a potential increase in container trade), leaving the Marshall Islands to rely on transshipment by a reportedly ageing fleet of reefer vessels.

Key **strategic options** emerge from the SWOT and revolve around the listed opportunities and threats as follows:

- Given the large volumes of tuna catch passing through Majuro (strength), address the small proportion of catches that are landed for sorting/grading/processing (weakness) and low levels of profits and direct value added (weakness), by sorting/grading catches to allow catches to be better used to generate differentiated products for end markets (opportunity).
- Address the periodic congestion in the harbour,³ which compromises vessel turnaround times (weakness), and the reliance on carrier vessels (threat), by expanding the use of containerized transport to canneries (opportunity).
- Combat the competition from other ports (threat) by building on the quality and range of support service provision (strength) supporting efforts to increase the ability of the Marshall Islands to effectively service and grow container services, providing tuna trading companies and owners of fishing vessels with more choice and a better mix of options (opportunity) to transport catches to canneries.
- Address the inability to export to the European Union (threat) by supporting the approval of a CA and enhancements in food safety standards on vessels and in onshore facilities, to capitalize on the demand for tuna in end markets and particularly in the European Union and United States of America (strength) and address the poor contribution of the VC to the balance of trade (weakness).
- Address the low labour availability and productivity when stuffing containers (weakness) and the age of cold storage capacity (weakness) by making employment in the VC more attractive, and by providing blended finance to support investments in container stuffing equipment and conducting studies to investigate and support cold storage investments (opportunity), building on the linkages of VC actors with vertically integrated companies (strength) that could also be expected to provide finance.

Informed by the SWOT analysis, the sustainability assessments, the VC map and stakeholder interests as reflected during consultations, an overall objective for the upgrading strategy has been developed with stakeholders in the form of a vision statement as follows:

“In 2031, the Marshall Islands will have strengthened its position as a leading hub for tuna through transshipment and containerization, with value addition through a sustainable value chain that will generate local employment and increase its resilience.”

The specific timeframe specified in the vision is based on the need to move quickly while allowing sufficient time for the strategies to support the vision to be put into place. Specific and measurable targets associated with the vision (by 2031) are:

- 30 percent of tuna flows in the Marshall Islands will be in containers and 70 percent transshipped;
- tuna purse seine export values of USD 55 million a year will be generated by Marshall Islands-based fishing companies;
- direct value added from the VC will be USD 33 million;
- There will be over 1 075 jobs in the core and extended VC within the Marshall Islands;
- 3 percent of mains water used by VC actors (unchanged from 2021); and
- five companies in the VC will be using some form of renewable energy in their operations.

³ Especially during July to September during the fish aggregating device closure.

The narrative for the upgrading strategy for the Marshall Islands' tuna purse seine VC represents an integrated approach to realize the vision. Through grants and other supporting measures (such as training), Marshall Islands-based companies will be incentivized to shift to a new and more efficient technology in the form of loading machines for filling containers with tuna. This technology will have two effects. First, it will bring down the cost of stuffing and shipping tuna in containers. Second, it will allow for the fish to be sorted. These changes will in turn incentivize the fishing companies to shift to containerization as they will be able to secure a higher price for the sorted fish and revenues will be higher. Increased demand for containerization will generate the revenues and economies of scale to make containerization more profitable over time. At the same time, outputs such as upgraded laboratory facilities, assessments of investments needed to improve vessel and shore-based fish hygiene, and a CA that is European Union-certified will allow fish landed in the Marshall Islands to be exported to the European Union market where higher prices can be obtained by the canneries buying tuna landed in the country. This will also contribute to an increase in the price that fishing companies can realize for their fish and thus further increase their incentive to shift to containerization. Furthermore, outputs such as detailed feasibility analysis and designs of expanded cold storage facilities, could provide justification for, and facilitate an increase in, cold storage capacity which would allow for even higher levels of sorting and therefore higher prices. The increase in containerization and sorting will generate jobs and tax revenues for the Marshall Islands and will allow the country to strengthen its position as a major hub for tuna landings and transshipments. Various outputs, such as detailed analysis and designs will introduce practices and technologies that will ensure that social and environmental hotspots such as labour availability and the need for greater use of renewable energy are addressed, and that risks and challenges, such as increased power requirements for plug-ins needed for containers, are fully considered.

Figure 11. Existing equipment used for stuffing containers with tuna



The proposed strategy to bring about the vision has four major elements:

1. *Increased containerization of purse seine-caught tuna for sale to canneries (or traders)* primarily in whole round frozen form having been sorted/graded, but potentially also following processing onshore into loins. This element exploits Majuro's position as a major hub for transshipment with large volumes of raw material flowing through Majuro port, to attract an increased proportion of existing catch that is currently transshipped to be containerized. Importantly, new and efficient machines for stuffing containers with tuna would be purchased to reduce times taken to fill containers and improve the quality of fish sent to canneries.
2. *Increased landings in the Marshall Islands, enabled by an approved and functioning CA and resulting in increased exports.* A CA is critical to allow fish landed in the Marshall Islands by Marshall Islands-flagged and non-Marshall Islands-flagged vessels to enter European Union markets (via canneries to which vessel owners sell their catch), following sufficient sanitary approvals. Improvements in the fish hygiene and food safety standards of the private sector operators running fishing vessels and onshore facilities in the Marshall Islands will also be necessary.
3. *Greater levels of storage and sorting of tuna in the Marshall islands prior to export, facilitated by increased cold storage capacity.* Facilities would enable catches to be landed, sorted and stored in the Marshall Islands prior to export in containers, and potentially for container stuffing to be completed in a temperature-controlled environment. As costs and benefits of construction and operation of such a cold store could be considerable, and the environmental and social impacts of such an investment have not been fully explored during the analysis and design phase of the FISH4ACP project, the viability of this component remains uncertain and will be further explored early in the implementation phase.
4. *Social and environmental sustainability improvements* to be realized through addressing the most critical "hotspots" identified in the social and environmental sustainability assessments.

The four elements of the upgrading strategy are strongly interlinked. For owners of fishing vessels currently transshipping fish through Majuro to achieve better prices from canneries, fish must be landed and sorted/graded, and/or processed. Transport from the Marshall Islands to canneries would then need to take place using containers rather than carrier vessels. This in turn could (subject to further investigations) require cold storage to hold product prior to transport to canneries. If fish is landed in the Marshall Islands rather than being transshipped, exports would have to be vetted and approved by an established CA to enable them to be eligible for the European Union market. Social and environmental sustainability improvements are cross-cutting in nature rather than fitting neatly under any of the three elements above and when combined, will serve to support the vision and minimize any risks of increased economic activity under elements 1 to 3 having an adverse social or environmental impact.

Progress towards realizing elements 1, 2 and 4 should begin to be evident within approximately two to three years. Work in support of element 3, in the form of a more detailed feasibility assessment, will start immediately, but results/outcomes under this element will take longer to become visible (approximately five years) given the time required to identify finance and construct additional cold storage facilities (if viable).

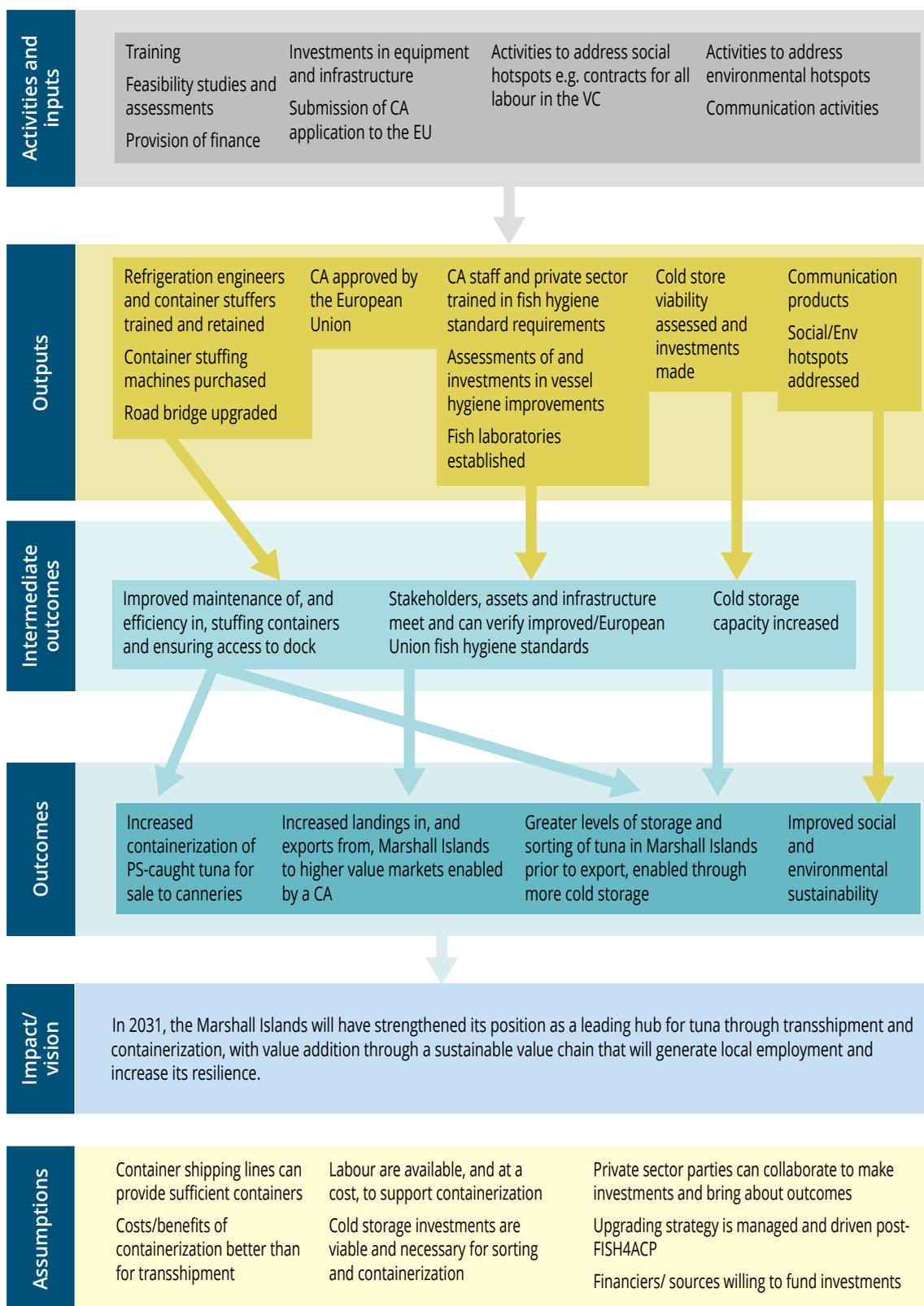
Figure 12. Example of improved equipment for stuffing containers with tuna to be purchased as part of the upgrading strategy



Note: The image shows a retractable conveyor belt and hydraulic operations.

A range of activities (e.g. studies, training) and investments by different stakeholders – including government, the private sector (core VC actors and service providers), the FISH4ACP project, and other donors – will produce outputs. These outputs will in turn bring about intermediate outcomes, in support of the outcomes and thereby the vision. The explanatory text above is presented graphically in **a theory of change** diagram to cover the whole upgrading strategy (whose implementation may go beyond the scope of the FISH4ACP project rather than being specific to the FISH4ACP project). Assumptions contained in the theory of change are indicative and not linked directly to specific levels within it (i.e. outputs, outcomes, etc.). A more detailed logframe for the upgrading strategy (provided as a separate document to aid with project implementation) contains assumptions that are specific to different levels of the logframe.

Figure 13: Theory of change for the overall upgrading strategy of the Marshall Islands' tuna purse seine value chain



Source: Macfadyen, G., Duong, G., Steve, M., Sahib, M., Bain-Vete, M. & Gillett, R. 2022. *The purse seine tuna fishery value chain in the Republic of the Marshall Islands: Analysis and design report*. Rome, FAO.

Successful implementation of the upgrading strategy would result in **upgraded business performance** of VC actors, an **enhanced enabling environment** from the presence of an approved CA and **upgraded governance** with increased levels of containerization enabling catching sector companies to increase the level of sales made direct to canneries, rather than needing to rely on sales to traders.

The key economic, social and environmental performance indicators under current and upgraded practises, aggregated at the VC level, are provided below (on an annual basis).

Table 1. Key economic, social, and environmental performance indicators under current and upgraded practices (aggregated at VC level)

Economic indicators	Current situation	With upgrading by 2031
Total revenues (USD)	122 160 173	136 680 834
Total profits (USD)	3 771 843	12 642 984
Direct value added (USD)	19 840 177	32 973 874
Number of jobs in core and extended VC	737	1 079
Total value of net wages for Marshall Islands residents (USD)	1 647 796	4 472 310
Total value added (USD)	44 345 350	61 194 581
Share of value added in national GDP (%)	36.3	44.8
Net impact on the balance of trade (USD)	-51 699 619	-5 012 207
Social indicators	Current situation	With upgrading
Net wages (for residents) as share of direct value added (%)	8	12
No. of FTE jobs for women in core VC	47	102
Share of direct value added captured by women (%)	1.0	1.2
Proportion (%) of Marshall Islands resident labour in VC having employment contracts	74	100
Environmental indicators	Current situation	With upgrading
Proportion (%) of mains Majuro water supply used by VC actors	3	3
Number of companies in the VC having increased their use of solar or other renewable forms of energy	n/a	5

Source: Macfadyen, G., Duong, G., Steve, M., Sahib, M., Bain-Vete, M. & Gillett, R. 2022. *The purse seine tuna fishery value chain in the Republic of the Marshall Islands: Analysis and design report*. Rome, FAO.

The upgrading strategy will increase the resilience of the VC through increased profits and a broader range of options for the VC in terms of modes of transporting fish from the Marshall Islands (more containerization along with transshipment) and access to new buyers (e.g. direct sales to canneries) and markets (European Union). It is expected that the resilience of the VC will be enhanced by the cold store (if constructed) as it would allow for increases in “redundancy”

i.e. the ability of VC actors to retain catches in the Marshall Islands and to act as a buffer against fluctuations in supply to market due to catch variations. Resilience will also be enhanced through implementation of the upgrading strategy because its implementation will imply/require increased levels of connectivity and collaboration between the VC actors and the extended VC. Activities in the upgrading strategy related to increasing the levels of women's participation in the VC and ensuring that the VC is attractive to unskilled/low-skilled labour, will increase levels of "participation and inclusion", thereby increasing resilience.



5. Implementation plan for the upgrading strategy

Bringing about these performance improvements and realization of the four elements of the upgrading strategy will require many activities to be funded and implemented. **FISH4ACP, the government, the private sector and other donors will all have a role to play in funding and implementing activities.**

Table 2 provides a summary **list of activities** in support of the different outputs. Some costs included in the table will need to be revised based on studies examining in more detail the feasibility and need for investments, and refinement of the cost estimates.

Activities to support specific outputs under each of the four elements of the strategy have been further articulated in the supporting and more detailed analysis and design document. In that document, for each activity a text description has been provided to help implementation, along with an indication of timing, funding source and type of investment.

The activity and investment plans are for the **whole upgrading strategy**, rather than being FISH4ACP-specific.

Table 2. Summary of upgrading activities and investments (USD)

Outcome 1: increased containerization of purse seine-caught tuna for sale to canneries		Funding source	Total costs (USD)	Type of cost	Timing (by)
Outputs	Activities				
Output 1.1 Feasibility study conducted and grant mechanism in place for blended finance for stuffing machines	Activity 1.1.1 Feasibility study and development of grant mechanism for acquiring container stuffing machines	FISH4ACP	25 000	Facilitation/ studies	Jun 2022
Output 1.2 Container loading/stuffing machines are operational and speed of stuffing containers is improved	Activity 1.2.1 Purchase container loading machines	FISH4ACP and private sector	900 000	Plant and equipment	Mar 2023
Output 1.3 Reefer container engineers trained	Activity 1.3.1 Training reefer container engineers	FISH4ACP	25 000	Training	Sep 2022

(cont.)

Output 1.4 Hazard Analysis Critical Control Point (HACCP) plans for containerization prepared	Activity 1.4.1 Prepare HACCP plans for containerization	FISH4ACP	25 000	Facilitation/studies	Sep 2022
Output 1.5 Infrastructure linking Pacific International Inc. (PII) site to main port is upgraded	Activity 1.5.1 Conduct inspection and determination of need for upgrading transport infrastructure linking shore-based facilities	Government (Ministry of Works) ⁴	150 000	Facilitation/studies	Dec 2022
	Activity 1.5.2 If necessary, complete civil engineering works to increase/ensure structural integrity of transport infrastructure linking shore-based facilities	Government (Ministry of Works) ⁵	300 000	Infrastructure	Dec 2024
Outcome 2: Increased landings in, and exports from, the Marshall Islands to higher value markets		Funding source	Total costs (USD)	Type of cost	Timing (by)
Outputs	Activities				
Output 2.1 CA provided mandate by European Union	Activity 2.1.1 Send legislation and completed questionnaire to Directorate General for Health and Food Safety (DG SANTE)	MIMRA	n/a	Facilitation/studies	Dec 2021
Output 2.2 CA and private sector staff are trained in fish hygiene	Activity 2.2.1 Training provided for CA staff in fish hygiene issues	FISH4ACP	35 000	Training	Mar 2023
	Activity 2.2.2 Training provided for private sector in fish hygiene issues	FISH4ACP	40 000	Training	Jun 2023
Output 2.3 Fish laboratories are established	Activity 2.3.1 Construct and equip microbiology, radiation and chemical labs	MIMRA	2 300 000	Plant/equipment	Jun 2023
Output 2.4 Fish laboratory standard operating procedures (SOPs) prepared	Activity 2.4.1 Prepare laboratory SOPs	Donor or FFA	35 000	Facilitation/studies	Jun 2023
Output 2.5 Audits of hygiene standards and investment requirements of Marshall Islands-flagged vessels and shore-based facilities are completed	Activity 2.5.1 Complete 12 vessel audits, investment specifications, and benefit-cost analysis of investments	FISH4ACP	40 000	Facilitation/studies	Mar 2023
	Activity 2.5.2 Complete audit of Pan Pacific Foods' loining plant, and sites being used by existing or potential containerization companies	FISH4ACP	25 000	Facilitation/studies	Mar 2023

(cont.)

⁴ Possible involvement and funding from JICA, but not yet certain.

⁵ Possible involvement and funding from JICA, but not yet certain.

Output 2.6 Vessel and shore-based upgrades and improvements in processes made to meet hygiene standards	Activity 2.6.1 Investments made in Marshall Islands-flagged vessels to meet European Union hygiene standards	Private sector	600 000	Plant/equipment	Dec 2023
	Activity 2.6.2 Investments made in loining plant to meet European Union hygiene standards	Private sector	100 000	Plant/equipment	Dec 2023
	Activity 2.6.3 Prepare vessel and shore-based sanitary standard operating procedures	FISH4ACP	35 000	Facilitation/studies	Dec 2022
Outcome 3: Greater levels of storage and sorting of tuna in the Marshall Islands prior to export		Funding source	Total costs (USD)	Type of cost	Timing (by)
Outputs	Activities				
Output 3.1 Cold storage feasibility study is completed	Activity 3.1.1 Complete feasibility study of potential cold store in the Marshall Islands	FISH4ACP	100 000	Facilitation/studies	Dec 2022
Output 3.2 Financing sources are available to fund cold store investments (if viable)	Activity 3.2.1 Agree arrangements for provision of finance from financiers to private sector for cold store investments	FISH4ACP	30 000	Facilitation/studies	Dec 2023
Output 3.3 Cold storage investment is made	Activity 3.3.1 Design, construct and put into operation cold storage facility	Private sector	5 000 000	Plant/equipment	Dec 2025
Outcome 4: Improved social and environmental sustainability of the VC		Funding source	Total costs (USD)	Type of cost	Timing (by)
Outputs	Activities				
Output 4.1 Research to address social hotspots completed and improvements actioned	Activity 4.1.1 Develop and disseminate communication products for social sustainability aspects of the upgrading strategy	FISH4ACP	70 000	Facilitation/studies	Jun 2025
	Activity 4.1.2 Investments made that help to prevent worker injuries and reduce worker's compensation liability within current operations and shore-based facilities based on insurance carrier's standards	Private sector	n/a	Facilitation/studies	Jun 2022
	Activity 4.1.3 Complete cultural and gender audit of companies and provide guidance on interventions to improve cultural/gender sensitivity and job attractiveness of current operations and facilities	FISH4ACP	25 000	Facilitation/studies	Dec 2022

(cont.)

Output 4.2 Research to address environmental hotspots completed and improvements actioned	Activity 4.2.1 Complete energy and water audits of companies and provide guidance on interventions to improve sustainability of current operations and facilities	FISH4ACP	25 000	Facilitation/ studies	Jun 2022
	Activity 4.2.2 Investments made in onshore facilities to improve energy and water sustainability and reliability of current operations	Private sector	250 000	Plant and equipment	Jun 2023
	Activity 4.2.3 Development of grant mechanism for acquiring off-grid solar power systems and hybrid solar diesel systems by/for the private sector	FISH4ACP	15 000	Facilitation/ studies	Dec 2023
	Activity 4.2.4 Purchase of off-grid solar power systems and hybrid solar diesel systems by/ for the private sector	FISH4ACP and private sector	250 000	Plant and equipment	Dec 2024
	Activity 4.2.5 Complete a study aimed at assessing port development needs, and increasing the use of renewable energy to meet the electricity needs of onshore VC activities within the Delap and PII port areas	FISH4ACP	35 000	Facilitation/ studies	Mar 2024
Output 4.3 Upgrading strategy Task Force established	Activity 4.3.1 Organization of a workshop to specify multistakeholder partnership	FISH4ACP	n/a	Facilitation/ studies	Jun 2022
	Activity 4.3.2 Hold Task Force bi-annual meetings	FISH4ACP	175 000	Facilitation/ studies	Jun 2025

Activities to be funded by		
 FISH4ACP	 Private sector	 Donors
 Government	 Blended sources (FISH4ACP and private sector)	

Source: Macfadyen, G., Duong, G., Steve, M., Sahib, M., Bain-Vete, M. & Gillett, R. 2022. *The purse seine tuna fishery value chain in the Republic of the Marshall Islands: Analysis and design report*. Rome, FAO.

Drawing on the information provided above, the investment table (Table 3) below provides an overview of the investments needed to realize the vision and how these investments are expected to be financed. The table also illustrates how blended finance strategies can be applied to fund investment in the upgraded business models identified in the VC strategy. It should be noted that the level of investments identified in the table below is indicative and will have to be confirmed by the various parties involved.

A total **investment cost of USD 10.5 million is estimated** for a variety of plants and equipment, facilitation and studies, training and infrastructure. Costs related to element 1 of the strategy account for 13 percent of total costs, element 2 accounts for 30 percent of total costs, element 3 for 48 percent of total costs (with USD 5 million estimated for cold store investments, subject to the findings of the feasibility study), and element 4 for 8 percent of costs. This means that if the cold store feasibility study (Activity 3.1.1) advises against proceeding with cold store investments, total costs to implement the strategy would be significantly reduced.

Table 3. VC upgrading investment table (USD)

In USD	Financing sources				Total
Type of investment	Donors	FISH4ACP	Government	Private sector	Totals by type
Equipment		312 500	2 300 000	6 537 500	9 150 000
Facilitation/studies	40 000	625 000	150 000	0	815 000
Training		100 000			100 000
Infrastructure			300 000	250 000	550 000
Totals by source	40 000	1 037 500	2 750 000	6 787 500	10 615 000

Notes:

1. A 10 percent contingency on FISH4ACP investments is recommended.
2. Some investments are dependent on studies providing sufficient justification and more detailed costings.
3. FISH4ACP investments do not include costs of a national project officer or Project Management Unit costs in FAO/Rome supporting project implementation.
4. Costs currently allocated to the government related to infrastructure linking shore-based facilities, may be covered by JICA and therefore could potentially be allocated to donors.

Source: Macfadyen, G., Duong, G., Steve, M., Sahib, M., Bain-Vete, M. & Gillett, R. 2022. *The purse seine tuna fishery value chain in the Republic of the Marshall Islands: Analysis and design report*. Rome, FAO.

Table 4 summarizes the key stakeholders involved in the four elements of the upgrading strategy.

Table 4. Key stakeholders and catalysts involved in the upgrading strategy and its four elements

Upgrading strategy elements	Key stakeholders and catalysts involved
Increased containerization (of purse seine-caught tuna for sale to canneries)	<ul style="list-style-type: none"> • MIFCO, Koo's and Pan Pacific Fishing Inc. (PPF) (core VC actors in catching sector) • Pan Pacific Foods and PII, and Marshall Islands Fishing Venture (MIFV)⁶ (all currently engaged with containerization) • Majuro Stevedore & Terminal Co (operator at Delap Dock, with container plug-in points) • FISH4ACP project for blended finance for container stuffing machines and training of refrigeration engineers and shore-side labour • Container shipping companies • Government and possibly JICA for assessing (and if necessary) upgrading infrastructure linking shore-based facilities
Increased landings in the Marshall Islands (and exports to higher value markets)	<ul style="list-style-type: none"> • CA staff in MIMRA (some staff already recruited, others to be appointed) • Private sector owners of fishing vessels and onshore facilities who may require training and support to improve fish hygiene and food safety standards, and who may need to make investments • FISH4ACP and other donors such as the World Bank providing financial resources for studies, training and laboratory investments
Greater levels of storage and sorting of tuna in the Marshall Islands prior to export	<ul style="list-style-type: none"> • FISH4ACP project to finance detailed investment appraisal/financial feasibility study • Pan Pacific Foods (operator of existing 2 000 tonne capacity cold store) • PII (interested in establishing a cold store at the "Kramer" dock) • Financiers
Improved social and environmental sustainability of the VC	<ul style="list-style-type: none"> • MIFCO, Koo's and PPF (core VC actors in catching sector) • Service/inputs companies based in the Marshall Islands

Source: Macfadyen, G., Duong, G., Steve, M., Sahib, M., Bain-Vete, M. & Gillett, R. 2022. *The purse seine tuna fishery value chain in the Republic of the Marshall Islands: Analysis and design report*. Rome, FAO.

The intention is for the main project phase of FISH4ACP in the Marshall Islands to continue seamlessly from the design phase and until the completion of this upgrading strategy, without any interruption. Most critically and urgently in achieving this is a need in **early 2022** to:

- Recruit a national project consultant. This individual will be based in the Marshall Islands with, if possible, a geographical proximity to local partner institutions (such as MIMRA).
- Negotiate and sign a Letter of Agreement (LoA) with MIMRA. This LoA will specify MIMRA's role in supporting the FISH4ACP project along with its obligations to deliver activities specified in the implementation plan (notably Activity 4.3.2).

The main project phase is expected to start in **January 2022**, and to run until **February 2025**, which is when the overall FISH4ACP programme will finish. The project will start with an **inception phase**, which will run from January to April 2022. This phase is critical for additional planning and stakeholder engagement prior to the implementation of upgrading strategy activities.

⁶ A longline fishing company but currently containerizing catch for some purse seine vessels in Majuro.

A number of **risks to successful implementation of the upgrading strategy** have been identified and assessed for their likelihood and potential impact. Mitigating strategies have been defined but risks cannot be completely avoided, as indicated in the table below.

Table 5: Risks associated with the upgrading strategy

Risk description	Likelihood (1-5)	Impact (1-5)	Overall Risk (1-25)	Mitigation
Container shipping costs and container availability reduce competitive position of container transport vis-à-vis carrier vessels	3	5	16	Working closely with container shipping companies
Economic leakage from the Marshall Islands of the benefits from the upgrading strategy due to foreign ownership of core VC actors	4	4	16	Activities involving Marshall Islands-based/owned service support providers, and government capturing benefits through taxes and fees
Private sector unwilling/ unable to invest in container stuffing machines	3	4	12	Specification of suitable grant mechanism and further assessment of containerization viability
COVID-19 impacts on implementation of upgrading strategy activities	3	4	12	Re-assessment of risks during project inception, and adapted implementation methodologies
European Union (DG SANTE) do not approve the Marshall Islands' CA based on current legislation and associated fish hygiene control standards	3	4	12	Work with CA and supporting organizations and projects (Pacific European Union Marine Partnership, FFA, World Bank) to take steps required by DG SANTE
Investments in cold store are not financially (or environmentally) viable	5	2	10	Feasibility study to be completed prior to investments
Lack of stakeholder enthusiasm for strategy post FISH4ACP	3	3	9	Participatory nature of FISH4ACP methodology, creation of Task Force
Renewable energy not financially viable	3	3	9	Feasibility studies, grants provided by FISH4ACP
Continued difficulties in attracting labour to work in the sector	2	2	4	Activities in strategy aimed at addressing social hotspots
Climate change impacts threaten investments	4	1	4	Appropriate siting and climate-proofing investments

Source: Macfadyen, G., Duong, G., Steve, M., Sahib, M., Bain-Vete, M. & Gillett, R. 2022. *The purse seine tuna fishery value chain in the Republic of the Marshall Islands: Analysis and design report*. Rome, FAO.

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This report presents the results of the value chain analysis of the purse seine tuna fishery value chain in the Republic of the Marshall Islands conducted from 2021-2022 by the value chain development programme FISH4ACP. This report contains a functional analysis of the value chain, assesses its sustainability and resilience, develops an upgrading strategy and an implementation plan to which FISH4ACP will contribute.

FISH4ACP is an initiative of the Organisation of African, Caribbean and Pacific States (OACPS) aimed at making fisheries and aquaculture value chains in twelve OACPS member countries more sustainable. It contributes to food and nutrition security, economic prosperity and job creation by ensuring the economic, social and environmental sustainability of fisheries and aquaculture in Africa, the Caribbean and the Pacific.

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